

# Pain Management

## *Natural Medicines & Nutraceuticals*

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## Natural Medicines & Nutraceuticals

- HYALURONIC ACID
  - A GAG (glycosaminoglycan) compound
  - Best evidence for intra-articular injection
  - Analgesic, anti-inflammatory & chondroprotective
  - Also a lubricant & shock absorber
  - Legend (vet product)
  - Synvisc, Hyalgen, Hylartin (human)
  - Better in mild OA – 10mg / joint
  - Injected weekly for 3 – 5 weeks (human)



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## Natural Medicines & Nutraceuticals

- ADEQUAN
  - Polysulfated glycosaminoglycan (PSGAG)
  - For osteoarthritis
  - Enhances hyaluronic acid production by the synovial membrane
  - Inhibits catabolic enzymes in OA joints
  - Encourages normalization of the synovial fluid and cartilage matrix

## Natural Medicines & Nutraceuticals

- ADEQUAN
  - Options – SubQ or IM injections
  - 4.4 mg/kg 1 – 2 x / week for 3 weeks then prn



## Natural Medicines & Nutraceuticals

- ELK VELVET-ANTLER EXTRACT
  - Origins: Chinese Medicine
  - From inner core of elk antler in the velvet stage of growth
  - Proposed Mechanism
    - Anti-inflammatory effect
    - Chondroitin sulfate content



## Natural Medicines & Nutraceuticals

- ELK VELVET-ANTLER EXTRACT
  - Clinically trialed in dogs
  - However: Prions for chronic wasting disease is found in this extract



## Natural Medicines & Nutraceuticals

- GREEN LIP MUSSEL EXTRACT
  - Contains glycosaminoglycans (GAGs) & Omega 3 Fatty Acids
  - Can be incorporated into dry foods



## Natural Medicines & Nutraceuticals

- MICROLACTIN
  - Special milk protein concentrate derived from hyper-immunized cows
  - General anti-inflammatory effect
  - 500mg BID



## Natural Medicines & Nutraceuticals

- AVOCADO SOY UNSAPONIFIABLES (ASU)
  - Dasuquin
  - Ratio of 1:2 avocado to soy
  - Slow acting symptomatic (not disease modifying)
  - Decreases expression of inflammatory mediators
  - Stimulates synthesis of cartilage matrix components



## Natural Medicines & Nutraceuticals

- GLUCOSAMINE / CHONDROITIN
  - Both are precursors in cartilage synthesis
  - Work synergistically
  - Both inhibit COX 2 & PGE2 synthesis
  - Therefore have an anti-inflammatory effect



## Natural Medicines & Nutraceuticals

- GLUCOSAMINE / CHONDROITIN
  - Research reports symptomatic & structural improvements but data is mixed for clinical efficacy
  - Disease modifying
  - 500 mg / 25 lbs
  - Varying quality & efficacy amongst products



## Natural Medicines & Nutraceuticals

- HOMEOPATHIC – ZEEL HCP (homeopathic combination preparation)
  - 2 human studies (not placebo controlled)
  - 1 canine study (placebo controlled)
    - Hip & elbow OA – better than placebo, not as good as carprofen



## Natural Medicines & Nutraceuticals

- OMEGA 3 FATTY ACIDS
  - Increases the omega-3 fatty acids in tissues & cell membranes
  - Helps decrease omega-6 fatty acid concentrations
    - Especially arachidonic acid (which is the precursor to prostaglandin production)



## Natural Medicines & Nutraceuticals

- OMEGA 3 FATTY ACIDS
  - They are bio-available & research shows that high doses can be given
  - Dog wt. in kg x 0.75 x 310 mg...



## Natural Medicines & Nutraceuticals

- Metylsulfonylmethane (MSM)??

ORAL SUPPLEMENTATION – for OA knee pain (human)

- Efficacy in conjunction with Boswellic Acid
  - 60 days with 5 g of MSM and 7.2 mg of BA (Notarnicola et al 2015)
- Efficacy for function and pain scores
  - 1.125 grams, 3x/daily for 12 weeks
    - (Debbi et al 2011)
- Efficacy for function, pain, (and no side effects)
  - 3g, twice a day for 12 weeks
    - (Kim et al 2006)



## Natural Medicines & Nutraceuticals

- Metylsulfonylmethane (MSM)??

ORAL SUPPLEMENTATION – for dogs?

- Studies could not be found. However...
- In RATS,
  - Dosing at 5 – 7 x the maximum recommended dose for HUMANS did not cause any adverse events!
  - Doses trialed were a single dose of 2g/kg or 1.5g/kg for 90 days





## Natural Medicines & Nutraceuticals

- CURCUMIN
  - The major component in Turmeric
  - Long used in TCM & ayurvedic medicine
  - In vitro research shows anti-catabolic, anti-apoptotic and anti-inflammatory effects
  - Has the capacity to increase type II collagen synthesis



## Natural Medicines & Nutraceuticals

- CURCUMIN
  - Natural curcumin is known for its very low bioavailability.
  - Must be dissolved in oil in order to be absorbed in droplets of fat in the blood & lymph
  - Dosage 4 mg/kg twice a day



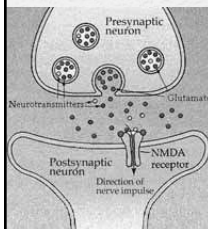
## Natural Medicines & Nutraceuticals

- CINNAMON or GINGER (each or either)
  - Reduced muscle soreness in female athletes
    - 3g x 6 weeks (Mashhadi et al 2013)
  - Reviews have reported Cinnamon's benefits on metabolic syndrome, inflammation, and pain.
    - (Shen et al 2012)



## Natural Medicines & Nutraceuticals

- MAGNESIUM??
  - Magnesium has been show in humans to help with chronic pain, fibromyalgia
    - NMDA receptors control firing at the neural synapses and are important mechanisms for neural learning & memory
    - Magnesium is a natural NMDA blocker



So extracellular Mg can block activation of the NMDA receptors & subsequently reduce pain firing

## Natural Medicines & Nutraceuticals

- MAGNESIUM??

### ORAL SUPPLEMENTATION

- What kind?
  - Calcium may reduce the absorption of Magnesium
    - & Cal-Mag has the lowest magnesium content
  - Use Mg-Citrate. Absorption is 17 – 33%
  - Mg also has a muscle relaxing actions, helps with sleep and can improve blood flow.
- How Much?
  - (Turan 2009) – studied Fibromyalgia patients
    - 600mg, 2x / day x 2 months



## Natural Medicines & Nutraceuticals

- MAGNESIUM??
- ANYTHING OUT THERE ON DOGS?
- Too much Magnesium (Mochizuki 1998)
  - 1200mg/kg/hr caused vomiting, staggering, and other bad things. (But was still reversible)
- Just right Magnesium (Gaynor & Muir 2009)
  - 5 – 15mg/kg IV (extrapolated from humans) – used for refractory cardiac dysrhythmias
- Oral?
  - We don't know!



## Natural Medicines & Nutraceuticals

- Cannabinoids (CBD) - Medical Marijuana
  - (THC is psychotropic & not medicinal)
  - CBD is therapeutic
  - Plenty of research in rats:
    - Cardiovascular disorders
    - Pain
    - Cancer
    - Asthma
    - Vomiting
    - Diabetes
    - Retinitis
    - Food intake / body weight effects



## Natural Medicines & Nutraceuticals

- Cannabinoids (CBD) - Medical Marijuana
  - Validated in humans for:
    - pain, inflammation, cancer, asthma, glaucoma, spinal cord injury, epilepsy, hypertension, myocardial infarction, arrhythmia, rheumatoid arthritis, diabetes, multiple sclerosis, Parkinson's disease, Alzheimer's disease, depression or feeding-related disorders, and many others.



## Natural Medicines & Nutraceuticals

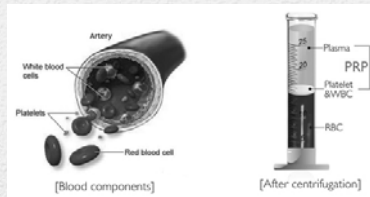
- Cannabinoids (CBD) - Medical Marijuana
  - Dosages in rats – 25mg/kg was most effective
  - In dogs (based on one vet's recommendation), when starting with a product use 1 drop of CBD oil / 10 lbs of dog per day. Increase every 4 – 5 days.

*(Rather nebulous, don't you think? But better than nowhere to start.)*



## Natural Medicines & Nutraceuticals

- HISTOPROMOTIVE THERAPIES
  - Platelet rich plasma
    - When platelets breakdown, they release growth factors
    - Super-concentrated platelets can be injected into joints, tendons, bone, or wounds
    - Good potential, research is still in the early stages



## Natural Medicines & Nutraceuticals

- HISTOPROMOTIVE THERAPIES

- Stem cells
  - Derived from adipose tissue or bone marrow
  - Preparation takes days to weeks
  - Studies in tendons, joints, spinal cord, & fractures
  - Good potential, research is still in the early stages



## Natural Medicines & Nutraceuticals

- OTHERS?

- Sleep Aides:
  - i.e. Melatonin
- Vitamin D / E / C / B
- Diet / Nutrition



But more research is needed...

## Natural Medicines & Nutraceuticals

- These things might be good adjunctives to a comprehensive Pain Management strategy for chronic joint pain...

